(140)

Analysis of Climate Variable and Fisherman Perception on Climate Change Divers in Negombo Lagoon Area

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Abstract

Climate change has undoubtedly become one of the most contentious issues in the international environmental debates and has escalated the impacts on fishery industries and fishing communities globally. This study was conducted to quantify the variations in climate variables, and coastal vegetation that may affect the fisheries industry due to climate change over past three decades in the Negombo lagoon area. Further, the knowledge and awareness of fisheries and associated communities on climate change was investigate. To understand the dynamics of the precipitation and temperature, monthly data for 30 years (1989-2022) were collected from the Department of Meteorology and 19 Module Bio-climatic Variables (MBV) were calculated to determine the climatologycal variation. The change in the coastal vegetation was analyzed using the Landsat 8 satellite using ArcGIS 10.8. A questionnaire survey and a focus group discussion were carried out as assess the knowledge, awareness and impact of climate change in the fisheries community (n=80). The mean annual and minimum and maximum precipitation ranged from 118.6 mm-268.6 and 0.6 mm - 826.6 mm. The mean, maximum, and minimum temperatures varied from 28.8^{o} C-32.3^{o} C, 33^{o} C-34^{o} C and 29^{o} C-30^{o} C. Out of 19 MBV variables, 9 variables had increasing trends while 3 variables had decreasing trend. The change percentage of coastal vegetation cover from 1992-2002, 2002-2012, 2012-2022 was observed as 35.71%, 4.99% and 6.13%. As per the peoples' knowledge of climate change, it was highlighted that around 50% of respondents does not have a proper idea on what is climate change (40% of respondents stated that the variation of precipitation and wind is the climate change drivers; Further, 40% of respondents attested that land use change with time has accelerated climate change while 30% of respondents mentioned that lack of coastal awareness and restoration programs is the second main reason for accelerated climate change that affect the fishery industry). The outcomes of the focus group discussion revealed that fishing activities are heavily affected by climate change drivers, and some engage in alternative jobs in extreme climatic conditions to feed their families. Finally, fishery communities highlighted the need for the government and other responsible authorities to take necessary actions to adapt and strengthen the resilience to climate change. This study corroborates the timely and topical obligation for sustainable fisheries management action planning for the Negombo area.

Keywords: Climate change, Coastal mangrove vegetation-precipitation-temperature change, Fisheries communities, Knowledge, Awareness, Negombo